REMARKS

In the Office Action mailed July 13, 2005, claims 1-5, 7, 9, 10 and 12 are presently pending. The Examiner rejected claims 1, 2, 7, 9, and 10 under 35 USC 103(a) as being unpatentable over U.S. Patent No. 5,838,732 (Carney) in view of U.S. Patent No. 6,268,818 (Xin) and further in view of Applicant's Admitted Prior Art. Claims 3 and 4 are rejected under 35 USC 103(a) as being unpatentable over Carney, Xin, Applicant's Admitted Prior Art and further in view of U.S. Patent No. 5,930,301 (Chester). Claims 5 and 12 are rejected under 35 USC 103(a) as being unpatentable over Carney, Xin, Applicant's Admitted Prior Art and further in view of U.S. Patent No. 6,483,817 (Antonio). Claim 12 was objected to for a typographical error.

1. Summary of the Claimed Invention

The application is directed to an RF transmitting device of a mobile radio communication base station in a CDMA system. The base station is capable of digital-modulating three baseband signals into three different frequencies in the discrete time domain. The CDMA system includes channel cards that provide three CDMA baseband signals to three digital modulators. The digital modulators effectively perform frequency division multiplexing by taking each baseband digital signal and translating it to a separate frequency (via digital multiplication with a complex sinusoid) and then combining the modulated (i.e., frequency shifted) digital signals. More specifically, the CDMA baseband signals are first passed through low-pass filters and interpolation filters, the baseband signals are then mixed to arbitrary local frequencies generated in the digital local oscillators by means of complex multipliers at frequency assignment intervals of 1.25MHz intervals. Next, the modulated baseband signals are added in an adder. The digital modulated signals are

coupled and are converted into an analog signal by means of a D/A converter. The analog signal is then converted into an IF signal using a first frequency upconverting unit. The IF signal is then passed through a bandpass filter. The bandpass filter is preferably a SAW filter having the bandwidth of 3.75MHz. Next, the filtered signal is converted into an RF signal using a second frequency upconverting unit. The RF signal is amplified to a transmitting output signal and the bandwidth of the transmitting output signal is limited. Finally, the RF signal is transmitted via an antenna.

2. Response to Rejections under § 103(a)

The Examiner rejected independent claims 1 and 10 as being unpatentable over Carney, Xin, and Applicant' Admitted Prior Art. The Examiner further rejected independent claims 12 as being unpatentable over Carney, Xin, Applicant's Admitted Prior Art and Antonio.

Applicant has amended independent claims 1 and 12 to clarify that the digital modulators comprise a digital local oscillator for outputting one of a plurality of local frequencies, and a digital mixer for generating mixed signals by mixing the baseband signals on the I/Q channels with respective ones of the plurality of local frequencies. Independent claim 10 was amended to clarify that the digital modulator comprises (i) a low-pass filter for low-pass filtering the baseband signals on the I/Q channels (ii) an interpolation filter for filtering the low-pass filtered baseband signals on the I/Q channels, (iii) a digital local oscillator for outputting local frequencies, (iv) a mixer for mixing each of the local frequencies from said local oscillator and each of the baseband signals on the I/Q channels which are sequentially passed through said low-pass filter and said interpolation filter.

Carney, the primary reference relied on by the Examiner, does not teach or suggest a digital modulator that includes these elements. Instead, Carney describes a base station that

generates a time domain signal via an IFFT process. That is, Carney maps data to a series of magnitude and phase values, assigns them to the various frequency bins, and then performs an Inverse Fast Fourier Transform (IFFT). This process does not use a complex multiplier (i.e., digital mixer), an interpolation filter, a summer (i.e., adder) for generating a multi-frequency composite signal and a digital local oscillator for generating arbitrary local frequencies. Xin and Antonio do not make up for this deficiency of Carney.

Thus, Applicant submits that independent claims 1, 10 and 12 are allowable. Furthermore, claims 3-5, 7, 9 depend from independent claim 1. Because dependent claims depend from allowable independent claim 1, the dependent claims are now allowable for at least the reasons set forth above.

CONCLUSION

In light of the above amendments and remarks, Applicant submits that the application is in good and proper form for allowance and respectfully requests the Examiner to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of this application, the Examiner is invited to call the undersigned attorney, at 312-913-3305.

Respectfully submitted,
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